REMARKS

Claims 8 - 10 were pending and under consideration, and Claims 1 - 7 and 11 - 14 have been withdrawn pursuant to an election.

In the Office Action, Claims 8 - 10 were rejected.

Accordingly, Claims 8 - 10 are now at issue.

I. 35 U.S.C. § 102 Anticipation Rejection of Claims

Claims 8-10 were rejected under 35 U.S.C. § 102(e) as being anticipated by Takahashi et al., U.S. Patent No. 6,870,718, hereafter "Takahashi". Applicants respectfully traverse this rejection.

Claim 8 is directed to a magnetic memory device, which comprises a magnetic memory element, an electrode, and a bit line. The magnetic memory element is formed in a ring-form, has a stacked structure which comprises a magnetic layer, a nonmagnetic layer, and a magnetic layer, and stores data utilizing spin momentum transfer switching. Takahashi fails to disclose or suggest the claimed magnetic memory element.

The spin momentum transfer switching is a method for inversion of magnetization by injection of a spin polarization current. This spin momentum transfer switching uses no current magnetic field. Inversion of magnetization of a memory cell is currently made via a current magnetic field generated when an electric current flows a conductor line. As the capacity of a magnetic memory device is increased, shrinking of the memory cell progresses. In accordance with this tendency, the current amount used for generating a magnetic field required for the inversion of magnetization is increased almost always as the cell size is reduced. As such, writing using a current magnetic field is difficult due to the limitation of the current density or the current amount which can be supplied.

In the claimed stacked ring-form structure which comprises a magnetic layer, a nonmagnetic layer, and a magnetic layer, a current is permitted to flow in the direction perpendicular to the plane of the memory element. In this case, the spin angular momentum of current electrons is transferred to local magnetization spin in one magnetic layer to induce precession, thus causing inversion of magnetization of this magnetic layer at a certain value of critical current or more. When electrons flow in the direction of from one magnetic layer to the

other magnetic layer, the magnetizations of these two magnetic layers are stable in a state such that they are parallel and point in the same direction. In contrast, when electrons flow in the opposite direction, the magnetizations are stable in a state such that they are parallel but point in the opposite direction. In other words, a relative angle between the magnetizations of one magnetic layer and the other magnetic layer can be controlled to be 0° or 180° by changing the direction of the flowing current.

Thus, in the spin momentum transfer switching, by allowing a current to flow in the direction perpendicular to the plane of a magnetic layer, inversion of magnetization can be made, and therefore a word line for writing is not required. The direction of the inversion of magnetization can be determined by adjusting the direction of the flowing current. (See Specification pages 30 - 32). In contrast, Takahashi fails to disclose the spin momentum transfer switching and requires a word line for writing.

Takahashi discloses a magnetic recording sensor which has a structure comprising a plurality of cells in parallel including a magnetoresistive sensor layer 2002 for recording information, a bit line 2001 connected to the magnetoresistive sensor layer for flowing an electric current 2003 to the sensor, a word line 2005 (with current 2006) in the position opposite the bit line 2001 by interposing therebetween the magnetoresistive sensor layer 2002 and in the position away tram the magnetoresistive sensor layer 2002 for performing recording operation onto the magnetoresistive sensor layer orthogonally to the bit line, an amplifying system for amplifying a read signal, and a read conductive line 2007 (supported by structures 2004, 2009) for switching between read and write, wherein the magnetoresistive sensor layer 2002 comprises the magnetoresistive sensor layer as shown in Example 1. (See Column 12, lines 12 - 49).

Thus, by requiring a word line for writing, Takahashi fails to teach or disclose a magnetic memory element that stores data utilizing spin momentum transfer switching.

Thus, Claim 8 is allowable over Takahashi, and dependent Claims 9 and 10 are also allowable for at least the same reasons.

Accordingly, Applicants respectfully request that these claim rejections be withdrawn.

II. Conclusion

In view of the above amendments and remarks, Applicant submits that Claims 8 -10 are clearly allowable over the cited prior art, and respectfully requests early and favorable notification to that effect.

Respectfully submitted,

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